

REMARKS

Upon entry of the present amendment, claims 1 and 3 will remain pending in the above-identified application and stand ready for further action on the merits.

The amendments made herein to the claims do not incorporate new matter into the application as originally filed. In this respect, claim 1 has simply been amended to incorporate limitations previously recited in claim 2 (now cancelled). Similarly, the dependency of claim 3 has been changed to reflect that it depends solely from claim 1.

Accordingly, entry of the present amendment is respectfully requested.

Claim Rejections Under 35 USC § 103

Claims 1-3 have been rejected under 35 USC § 103(a) as being unpatentable over Colton et al. (WO 89/00918), in view of Nishikawa et al. (US 5,997,781). Reconsideration and withdrawal of this rejection is respectfully requested based upon the following considerations.

By way of the instant amendment, the claimed subject matter is limited to embodiments using a resin of which flowability is highly improved by carbon dioxide. The solubility of carbon dioxide into a resin and the resin flowability-improving effect by carbon dioxide vary depending on resins. At the time of the invention, it

had not been known that resins having a specific dissolution amount show a high flowability-improving effect.

The USPTO asserts that it is assumed from column 12, lines 22-40 of Nishikawa et al. that 0.1 weight percent of carbon dioxide is dissolved into the molten resin at a pressure of approximately 7 MPa and the subject matter of the former claim 2 would have been *prima facie* obvious from the molding process disclosed in Colton et al. in combination with the operating conditions taught by Nishikawa et al.

In response to the Examiner's assertions, Applicants note the following.

The disclosure of Nishikawa et al. in column 12, lines 22-40, merely teaches that a preferred range of the gas amount to be absorbed at the cylinder is from 0.1 to 30 parts by weight (lines 25 to 27) and that it is necessary to maintain the system (a resin having dissolved therein a gas) above the critical pressure and critical temperature (e.g., 75.3 kg/cm² and 31.35°C in the case of carbon dioxide and 33.5 kg/cm² and -147°C in the case of nitrogen). Nishikawa et al. is silent about the gas-dissolving capability of a resin.

On the contrary, the present invention is based on the finding that specific resins that show a dissolution amount of carbon dioxide at the molding temperature of not more than 0.3 wt%/MPa with respect to the pressure of the supplied carbon dioxide show

good flowability-improving effect by carbon dioxide. Neither of the cited references teaches or suggests such a basic concept of the present invention.

Additional Comments

Example 1 of Nishikawa et al. indicates that 15 parts by weight of carbon dioxide after compression to 180 kg/cm² was fed to a polystyrene resin molten at 230°C and dissolved therein. However, the saturated dissolution amount of carbon dioxide with respect to polystyrene at 200°C and 200 kg/cm² is about 6.4 wt%. It is impossible that 15 wt% of carbon dioxide is dissolved in polystyrene under conditions of a higher temperature and a lower pressure that decrease the solubility. Taking this into account, Nishikawa et al. is directed to a supercritical fluid/resin mixture in which carbon dioxide of an amount higher than the saturated dissolution amount and a resin are mixed. Such is completely distinct from the present invention directed to a homogeneous resin in which carbon dioxide is dissolved in a resin in an amount not higher than the saturated dissolution amount.

Accordingly, based upon the above considerations, it is clear that the cited art provides no motivation or teaching to those of ordinary skill in the art that would allow them to arrive at the present invention as claimed or the advantageous results that flow therefrom.

CONCLUSION

Based upon the amendments and remarks presented herein, the Examiner is respectfully requested to issue a Notice of Allowance clearly indicating that each of pending claims 1 and 3 are allowed and patentable under the provisions of Title 35 of the United States Code.

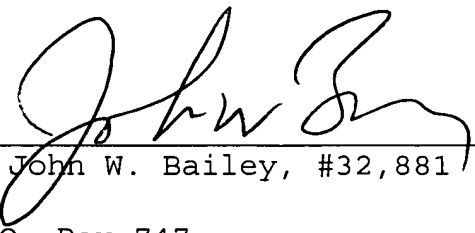
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact John W. Bailey (Reg. No. 32,881) at the telephone number below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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By


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